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ELECTROLYSIS IN GYNÆCOLOGY.

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Reprint from OMAHA CLINIC
October, 1891.



THE USE OF ELECTROLYSIS IN GYNÆCOLOGY.*

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About a year ago, I sent a circular to every regular physician in Nebraska, asking them to kindly let me know the extent to which they had made use of electrolysis in gynæcological practice and the results obtained in each case. The answers were few and meagre, only about 40 answers being received to over 780 inquiries, and of these only four claimed to have used electrolysis at all. So I decided to give up the plan I then had of writing up a resume of the subject with the experience of the entire medical profession of Nebraska, and postponed writing up my own experiences for some future occasion.

This is a comparatively new but very promising field for investigation and work. Electricity has of course been used for many years, but its application for the treatment of gynæcological troubles is of rather recent date. Cutter and Kimball were, I believe, the first ones to use electrolysis for the cure of

*Read before the Nebraska State Medical Society at Lincoln Neb., April, 1891.

uterine tumors, especially fibroids, in a systematic manner, but their method of puncturing through the abdominal walls into the uterus with two needles connected with strong galvanic currents was so dangerous that it found but few followers, and never took root as an accepted gynæcological procedure. In the works of Thomas and Munde, both published in 1880, I find no mention of electrolysis, but Bartholow, as early as 1881, recognizes it as a very useful agent in certain classes of gynæcological disorders.

I shall not occupy your time by attempting to trace the present accepted methods of using and applying electrolysis through their various stages of development, but simply wish to say that, among the numerous workers in this field, Tripier and Apostoli, in Europe, and Martin and Massey, in this country, were the ones mainly instrumental in popularizing the use of electrolysis in gynæcology by laying down definite rules for the easy guidance of the profession in its application.

The effect of electrolysis is produced in one of two ways, either by chemical action of the substances liberated by the different poles, the positive liberating acids and oxygen, and the negative alkalies and hydrogen; or a certain pro-

cess of resolution of tissues more remote, the exact explanation of which has not yet been arrived at.

Electrolysis has been used in almost every disease with which gynæcologists have to deal, but in some of these instances it has been discarded in favor of other and better measures. In enlargement of the uterus, whether due to the products of chronic inflammation, to a lack of involution, or to new formation of tissue other than malignant, electrolysis is today considered the treatment "par excellence," and operative measures are only resorted to after it has been given a thorough trial. In catarrhal conditions of the uterine canal, mild electrolytic applications will generally bring about a return to a normal condition.

In order to apply electrolysis, it is necessary to have the following apparatus: *a good and sufficiently powerful battery*. I have used a fifty cell Barrett battery, which has given me satisfaction in all cases, and has the advantage of being small, compact and portable; *a water rheostat* to regulate the strength of the current and enable one to turn on, increase or diminish the latter gradually without shocking the patient; *a milliammeter* to measure the strength of the current so as to know just what amount

of current is passing through the patient; *an intra uterine and an abdominal electrode*. The latter, as devised by Apostoli, consists of a round mould of potter's clay covered with cotton batting or cloth. As this was rather heavy and inconvenient, a plate of metal, covered with an ox bladder in such a manner as to be able to hold warm water, was devised. This, however, has the disadvantage that the bladder will sometimes thin out at one point and suddenly burst. If this happens when you are treating a patient, as it has a couple of times to me, you are placed in a not very enviable position. I now use a round, flexible tin plate, covered on one side with felt, which can be soaked with hot water and moulded to the shape of the abdomen of the patient. *Connecting cords* must also be used to connect the various parts of the apparatus. In the combination which I use, I have two Mackintosh cords, one end of each of which is ground down to fit the Barrett battery. With this apparatus, I have had no difficulty in regulating the current and getting a weaker or stronger one, as the case may require.

In the treatment of troubles of the mucous membranes, I have found the weaker currents of from 25 to 75 milli-

amperes, to be of much greater value than the stronger ones. In cases of fibroids, the current used may run up as high as 150 to 200 milliamperes without injury to the patient, if care is taken in turning on this current gradually and not by sudden fits and starts.

In general, the positive pole is to be used when there is too much tendency to hemorrhage, while in most other cases the negative pole is used, but even in this, I find equally good authorities differ, they all, however, conceding to the positive pole the power of a hemostatic.

Electrolysis is counterindicated in general in all acute inflammatory affections. Massey also warns against its use in papilloma of the broad ligament, and in ovarian tumors.

The following are some of the cases which I have treated, the results in each of which will speak for themselves.

Case 1.—Mrs. M., age 45 years, a tall, well built lady of excellent physique, called at my office March 13th, 1889, presenting the following history: On February 11th, 1889, during the time of her menstrual period, she was thrown out of her carriage, striking on her side when she fell. She immediately experienced a sharp pain in her right side, but a prominent surgeon who examined her

at the time claimed that he found no bones broken, and that she had simply been badly shaken up and frightened. He prescribed medicines, but failed to give any permanent relief. On the contrary, her pain grew worse, until, on the date above mentioned, when she called at my office.

She had always enjoyed good health, except when four years ago (in 1885) a hard lump was removed from her left breast. With the exception of the periods of gestation, and lactation of her four children, the youngest of which was then six years old. She had always menstruated regularly and without pain. Since the time of the accident she has not menstruated.

I found on examination of the chest an oval lump of the size of a hen's egg in the anterior axillary line on the right side in the course of the eighth rib and corresponding to the seat of pain. It was evident to me that this rib had been broken, callus had formed, and the pressure of this had kept up and aggravated the pain. She complained of pain lower down in the abdomen, which I could not attribute to the fractured rib, and so I examined the pelvic organs. The fundus of the uterus seemed to present two distinct halves, the right one

hard and nodular, somewhat of the shape and size of a kidney with the hilus turned upwards, and the convexity downwards and outwards. The left half of the body of the uterus was softer, more normal in consistence and size. There had been no history of amenorrhœa, dysmenorrhœa, or menorrhagia, and the only symptom pointing toward any possible trouble in the uterus had been an indefinite dragging sensation in the pelvis. No discharge and nothing abnormal about cervix at this time. I prescribed an anodyne liniment, and some pills containing ergotin and nuxvomica, following otherwise an expectant policy.

March 27. I again examined patient, finding the left half of the womb larger than before and rather round. It felt like a rubber ball, and when compressed would immediately regain its former round shape upon relaxation of pressure. General health good. Right half of uterus same as before.

April 8th. The left half of uterus still keeps on growing, distinctly gives Hegar's sign of pregnancy, that elastic rebound of the uterus following compression and relaxation. It is about of the size of a uterus two months pregnant. No menses have appeared since the time

of the accident. Patient looks and feels well, with the exception of a slight nausea every morning. Balance of the day she feels O. K. I informed her that I suspected she was pregnant, but she denied the possibility of such an occurrence. For the present, all active medication was discontinued. On meeting her husband the same day, he was still more emphatic as to the impossibility of pregnancy.

April 15th. Condition still corresponds to assumption of diagnosis of pregnancy. Right half of uterus has not changed in size or shape since first examination. Left half round as a rubber ball, rebounding upon relaxation of pressure. Morning sickness still continues. General health otherwise good. Vagina soft succulent. No discharge from uterus. Cervix soft just as in pregnancy. On the day after this, Mr. M. told me that his wife had become reconciled to the diagnosis of pregnancy and was feeling quite well, so that I need not call again until sent for. (This was April 16.)

May 22nd. On being called again, I found a very marked change during the last five weeks. The patient did not feel so well as before, complained of back-ache and pain in the thighs especially when standing or walking around. The uterus had taken on a rapid growth,

and was of the size of a large California orange. The body of the uterus was now of the consistence of cartilage, unyielding, no longer gave the sensation of rebounding noticed earlier in the history of the case. Pregnancy was now out of the question. It was undoubtedly a fibroma or sarcoma. I suggested hysterectomy, and intended to turn her over to a surgeon who had done this operation before, but the patient would not have any operation, so I called a consultant to settle on some definite course for the future. The latter agreed with me in the diagnosis, and the plan hitherto pursued, and suggested that I try electrolysis in this case. I suggested this to the patient, at the same time telling her that I had never treated a case in that way before, and would first have to obtain the necessary apparatus. With the understanding that it was to be a mere experiment, and that I was to be relieved of all responsibility, that she was to continue under treatment at least six weeks, unless her condition became such as to imperatively demand cessation of this course—with an understanding as to all these points, I purchased the apparatus and set about treating her. The strength of current used ranged from 40 to 150 m. p., the

length of time the application was continued was four minutes, and the poles used were the negative intrauterine and positive abdominal. The applications were made about once in five days.

Result. It was about the middle of June before I had procured the necessary apparatus and was ready to begin the treatment. By this time, pain in the flexors of the thighs, with shooting pains in the thighs, was complained of. After about three weeks' treatment, the tumor had apparently diminished in size somewhat, the aches and pains had also become less frequent and persistent, and the patient felt greatly encouraged. The electrolytic treatment was continued about two months, but with the exception of the above there was no change. Toward the end of this time the pain in the thighs became more severe and persistent, the general health of the patient was rapidly failing, and a hard lump of the size of a hen's egg had formed at the sterno clavicular articulation of the right side. Her husband took her to Wisconsin, their former home, but stopped on the way at Chicago to consult Dr. N. S. Davis, who pronounced it to be a case of malignant tumor, and advised cessation of all active treatment. She should return home and prepare to die, as she

would not live longer than about three months. This advice had the effect which might be expected of it. She now began to fail rapidly, and died in December 1889, just ten months after being thrown out of her carriage. The abdominal tumor at the time of her death was as large as an eight month pregnancy. I asked for the privilege of a post mortem, but this was denied me.

This case is of great interest in several particulars: *First*. It shows the unreliability of Hegar's sign of pregnancy. *Second*. The difficulties in the way of a proper diagnosis in the earlier stages of this case were such that the error of assuming it to be a pregnancy was in a measure justifiable. The cessation of menstruation, the gradual enlargement of the uterus, the morning nausea, the absence of cachexia or glandular enlargements were symptoms which might mislead the best of us. *Third*. The question also arises as to whether, if this was a malignant sarcoma from the start, the electrolysis had any influence in hastening or retarding its growth.

Case 2—Mrs. H 43 years old, mother of eight children, the youngest of which is three years old, came to me Sep. 30, 1889, from the northern part of

state, with the following history. She is of medium size, with healthy complexion, and claims to date her ailment back two years. For a year after the last child was born, she felt pretty well; but then she noticed that her menses were becoming somewhat more profuse at each period and the intervals shorter. During the intervals a leucorrhœal discharge kept on. Dysmenorrhœa was also complained of. The uterus was found to be enlarged so that the sound entered three inches. Also somewhat anteflexed and endometrium bled upon slightest touch of sound. Diagnosis, subinvolution with endometritis chronica. Treatment, internal administration of ergotin and nuxvomica, and locally twice a week the positive pole of Barrett's battery from 50 to 100 m. p. After five treatments, menses reappeared almost without pain and were not so profuse. Patient returned home feeling improved, and promising to return, but never did return nor write about her condition.

Case 3—Mrs. K. H, 43 years old, a rather small, but well built lady, with healthy complexion and hair turning slightly gray, came to me December 31, 1889. She has had four children, the last one some eighteen months ago, since which time she had been in good health, until about a year ago.

She complains of pelvic pain, pain in the back and groin increased during menstruation. Menses regular, profuse and accompanied by expulsion of clots. She can feel a lump in the lower part of her abdomen which has alarmed her, and on account of which she came to Omaha to be treated. Menses have appeared regularly, somewhat profuse and painful, but lasted only four or five days, with no discharge between times. Sound passes into uterus $3\frac{1}{2}$ inches without any obstruction, and is not bloody when withdrawn. Uterus upon bimanual manipulation is found to be considerably enlarged, somewhat anteverted, but not tender to pressure. The enlargement of the uterus seems to involve the anterior wall more especially. Pressure in right ovarian region is somewhat painful. Vagina presents a normal appearance, no signs of congestion or cyanosis being perceptible. Cervix enlarged, somewhat hardened and thickened, rather paler than usual, and os normal in size and appearance. Diagnosis, subperitoneal fibroid.

Treatment consisted in the application of the galvanic current, with negative pole in uterus, and positive on abdomen. This increasing the hæmorrhage occasionally, the application of the positive

pole intrauterine became necessary. This treatment was applied three times a week during the first month, twice a week during the second, and about five or six treatments were given during the third month, at the end of which time the uterus only measured two inches in depth, the menses were painless, normal in quantity, and lasted but two days. She now went home, after procuring an entire electrolytic outfit, and having her physician come to Omaha to learn how to continue the treatment. I heard from her from time to time through the mails, and she has remained in good health ever since.

On April 6th, 1891, she came to Omaha again to inquire as to whether the treatment might not be discontinued now that she was practically cured. I found uterus still measuring but $2\frac{1}{4}$ inches, and normal in shape and position and advised discontinuing the treatment for a while. I have not heard since from her, and judge from this that she has remained well.

Case 4—Mrs. H., of Omaha, Neb., age 31 years, mother of boy who is six years old. Ever since birth of that child she has suffered from dysmenorrhœa and nervous headaches preceding the onset of the menstrual flow. The pains

would cease as soon as the flow was well established, but for two days previous to this she was almost helpless, and found herself compelled to stay in bed. In December, 1889, she applied to me for treatment. I found uterus anteverted, measuring 3 inches, with a cervical endometritis. There was a laceration of the cervix with slight ectropum of lips. I treated her by the old method of applying iodine and glycerine by means of a probe wrapped with cotton to the cervical canal, and boro-glyceride tampon. After three months' treatment by this method, I could only see slight improvement. The dysmenorrhœa and nervous headaches still occurred, though not quite so bad as before. On March 7th, 1890, I thought I would abandon this method of treatment and try the application of electrolysis. Accordingly, I made negative cauterization of the cervical canal with a current of the strength of about 75 m. p. and duration of about five minutes. Patient returned in about a week, reporting that menses had set in three days after last treatment, without pain or headache. Treatment was discontinued, but patient has been entirely free from pain at her menstrual periods since. This result, following one application of electrolysis, is certainly remarkable.

Case 5—Mrs. D., 28 years old, came to me for treatment of an endocervicitis with uterus bound down in a strongly antverted position and slightly lacerated, as three years previous she had had a miscarriage, following which she was sick in bed for 16 weeks with a pelvic cellulitis. In January, 1888, I attended her in confinement with her first child. The first stage of labor was delayed considerably by irregular dilation of the os. This in turn was due to old inflammatory deposits, which held the junction of body and cervix bound down at certain points and prevented the regular dilation of the canal. During the year 1889, I treated her several times for cervical catarrh by the old method of local medicinal applications to the endocervix. I always found the uterus firmly bound down in an anteverted position. The treatment would benefit her for a while, but then again the old trouble would return. Thus it went, until January 27, 1890, when I decided to try the application of electrolysis. A mild current of 40 m. p. was applied to the cervical canal for a period of four minutes. These applications were repeated at intervals of from 3 to 5 days, with the exception of the menstrual period, during which time and for forty-

eight hours afterwards no application was made. The last application was made March 28th, 1890. On April 5th, patient reported that she had missed her regular monthly period, and thought pregnancy had set in. I found the uterus now freely movable, forward and backward, as well as upward and downward, and, as the cervical catarrh seemed to have stopped, the treatment was now discontinued. In the early part of May, 1890, she returned to me, complaining of nausea and vomiting occurring every morning. I found uterus enlarged and with a thick glassy discharge issuing from the cervix. The cervical catarrh had returned, and I thought it safe to try the application of electricity on the local diseased mucous membrane, in order to determine how far this was to blame for the vomiting. After two applications, the vomiting was greatly ameliorated, and the local condition improved. Treatment from this time was discontinued, and patient passed through a perfectly normal pregnancy, which terminated in a normal labor, January 3d, 1891. The only complication during this labor was a very severe post partem hemorrhage, due to atony of the uterus and probably also too great haste in the delivery of the placenta.

The puerperium was perfectly normal, and both mother and child are now in the enjoyment of the best of health.

Case 6—Mrs. J. H. H., troubled with cervical catarrh, relieved by one application of electrolysis on September 29, 1890. Has reported herself free from trouble as late as April, 1891.

